

## REMARKS

Reconsideration and allowance of the above-referenced application are respectfully requested.

### I. STATUS OF THE CLAIMS

Claims 10 and 32 are canceled herein.

Various of the claims are amended herein.

In view of the above, it is respectfully submitted that claims 1-9 and 11-31 are currently pending.

### II. REJECTION OF CLAIMS 20-22 UNDER 35 USC 101

Claims 20-22 are rejected under 35 USC 101 as being directed to non-statutory subject matter.

Independent claims 20 and 22 are amended herein to include “simulating phenomena of the combined particle.” This recitation clearly satisfies the USPTO requirements for computer-implemented inventions to be statutory subject matter. For example, this recitation would clearly relate to a practical application in the technological arts under MPEP 2106 section IV(B)(2)(b)(ii).

Further, with this recitation, the claims clearly provide “a useful, concrete and tangible result,” in compliance with State Street Bank & Trust Co. v. Signature Financial Group Inc., 47 USPQ2d 1596.

In view of the above, it is respectfully submitted that the rejection is overcome.

**III. REJECTION OF CLAIMS 1-32 UNDER 35 USC 112, FIRST PARAGRAPH**

Claims 1-32 are rejected under 35 USC 112, first paragraph.

In Item 4 on pages 2-3 of the Office Action, the Examiner asserts that it is not clear how components of the combined particle are combined. Thus, the Examiner requests that the Applicant forward a software package implementing the invention so that the Examiner can determine what constitutes “combined.”

It is respectfully submitted that none of the claims recite the act of “combining.” Instead, various of the claims recite features relating to a “combined particle.” For example, as recited in claim 2, the “combined particle” is formed of substrate particles and adsorbate particles. It is respectfully submitted that substrate particles and adsorbate particles are known. Moreover, it is respectfully submitted that particles formed of both substrate particles and adsorbate particles are known. Therefore, it respectfully submitted that a combined particle would be understood by a person of skill in the art, and that it is not necessary for the Applicant to submit a software package, or a working model, of the present invention.

In Item 5 on page 3 of the Office Action, regarding the recitation in claims 6, 8 and 29 of “... indicating whether the smaller particles of a respective individual particle are fixed against center of mass of the individual particle...,” the Examiner asserts that it is not clear what the individual particles and smaller particles are. It is respectfully submitted that, in these claims, it is not intended to limit the recited particles any further. However, as an example, the individual particles might be adsorbate particles, and the smaller particles might be atoms of the adsorbate particle. See, for example, steps S422, S423 and S424, and the corresponding disclosure on page 28, line 9, through page 30, line 8, of the specification.

In Item 6 on page 3 of the Office Action, regarding claim 27, the Examiner asserts that it is unclear how a substrate particle can include a free particle since, as asserted by the Examiner, by definition a substrate particle is connected to a lattice. The Applicant could not find any definition indicating that a substrate particle is connected to a lattice. Therefore, if

the Examiner maintains the rejection, it is respectfully requested that the Examiner indicate where such a definition can be found. Instead, it is respectfully submitted that a substrate particle is not part of a lattice structure, and that the claim recitations are correct.

In view of the above, it is respectfully submitted that the rejection is overcome.

**IV. REJECTION OF CLAIMS 1-3, 5-6, 8-10, 12, 15-18, 20-23 AND 29 UNDER 35 USC 112, SECOND PARAGRAPH**

In Item 10 on page 4 of the Office Action, the Examiner asserts that the meaning of a "combined particle" is unclear. More specifically, the Examiner asserts that the recitation in claim 1 that "a combined particle formed of individual particles," is confusing when taken with the recitation in claim 3 that "the combined particle is formed of substrate particles and adsorbate particles, each said individual particle being an adsorbate particle."

The Applicant agrees that, at first glance, the recitation of the combined particle may appear confusing. However, upon a detailed review of the claims, it is respectfully submitted that the claimed combined particle is clear. More specifically, in a typical example, a combined particle might be formed of substrate particles and adsorbate particles. However, claim 1 is intended to broadly recite the combined particle as being formed of "individual particles," without identifying any of the particles as being substrate particles or adsorbate particles. Therefore, as recited in claim 1, the kinetic condition setting unit and the particle motion computing unit perform certain operations with respect to these "individual particles."

Then, claim 3 recites the combined particle as being formed of substrate particles and adsorbate particles, and that each individual particle recited in claim 1 is an adsorbate particle. Therefore, when claim 3 is taken together with claim 1, it can be seen that a combined particle is formed of substrate particles and adsorbate particles, but that the various "individual particles" relating to the operations of the kinetic condition setting unit and the particle motion computing unit are adsorbate particles.

In Item 11 on page 4 of the Office Action, as per claim 29, the Examiner asserts that the recitation of “each adsorbate particle includes a plurality of smaller particles” is not clear. This recitation can be understood, for example, by referring to step S422 in FIG. 14, and the corresponding disclosure on page 28, lines 9-20, of the specification. As can be understood by this disclosure, each adsorbate particle is formed of smaller particles such as, for example, atoms.

**V. REJECTION OF CLAIMS 1-32 UNDER 35 USC 103 AS BEING UNPATENTABLE  
OVER MISAKA IN VIEW OF BAUMANN, THE EXAMINER'S OWN  
EXPERIENCE AND THE TAKING OF OFFICIAL NOTICE**

Baumann discloses that incoming spheres nearby the surface are generated by a Monte Carlo method.

Misaka discloses a “particle transport model” for use in a simulator.

**However, neither Baumann nor Misaka discloses that each individual particle has a corresponding emission source, and that the individual particles are generated in accordance with the positions of the emission sources.**

Therefore, to more clearly distinguish claim 1 over the cited references, claim 1 is amended herein to include the limitations of claim 10, and claim 10 is canceled. Similarly, claim 24 is amended to include the limitations of claim 32, and claim 32 is canceled.

Similar amendments are made to claims 16, 20 and 23.

Please note that independent claims 12 and 22 already recite that each individual particle has a corresponding emission source, and that the individual particles are generated in accordance with the positions of the emission sources.

In view of the above, it is respectfully submitted that the rejection is overcome.

**VI. REJECTION OF CLAIMS 1, 12, 16, 20 AND 22-24 UNDER 35 USC 102(B) AS BEING ANTICIPATED BY REEVES (1983) OR COHEN (1992)**

Reeves relates to modeling "fuzzy" objects such as clouds, smoke, water and fire. By contrast, the present relates to the generation of individual particles, such as, for example, adsorbate particles.

Moreover, neither Reeves nor Cohen discloses that each individual particle has a corresponding emission source, and that the individual particles are generated in accordance with the positions of the emission sources.

In view of the above, it is respectfully submitted that the rejection is overcome.

**VII. REJECTION OF CLAIMS 1, 12, 16, 20 AND 22-24 UNDER 35 USC 102(E) AS BEING ANTICIPATED BY KINEMA/SIM**

Kinema/Sim does not disclose that each individual particle has a corresponding emission source, and that the individual particles are generated in accordance with the positions of the emission sources.

In view of the above, it is respectfully submitted that the rejection is overcome.

**VIII. REJECTION OF CLAIMS 2-11, 13-15, 17-19, 21, 25-26 AND 28-32 UNDER 35 USC 103 AS BEING UNPATENTABLE OVER OHIRA OR YAMADA IN VIEW OF KINEMA/SIM OR REEVES OR COHEN AND THE TAKING OF OFFICIAL NOTICE.**

Neither Ohira nor Yamada disclose or suggest how to set an emission source for an individual particle, such as an adsorbate particle, or how to generate the individual particle in accordance with the position of the emission source.

Moreover, the above comments for distinguishing over the other cited references also apply here.

In view of the above, it is respectfully submitted that the rejection is overcome.

**IX. REJECTION OF CLAIM 27 UNDER 35 USC 103 AS BEING UNPATENTABLE  
OVER OHIRA IN VIEW OF KINEMA/SIM OR REEVES OR COHEN, AND THE  
TAKING OF OFFICIAL NOTICE**

The above comments for distinguishing over the various cited references also apply here.

In view of the above, it is respectfully submitted that the rejection is overcome.

**X. CONCLUSION**

In view of the above, it is respectfully submitted that the application is in condition for allowance, and a Notice of Allowance is earnestly solicited.

If any further fees are due by the filing of this Amendment, please charge same to deposit account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY

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